SUMMARY

THE BIOLOGY OF BELIEF

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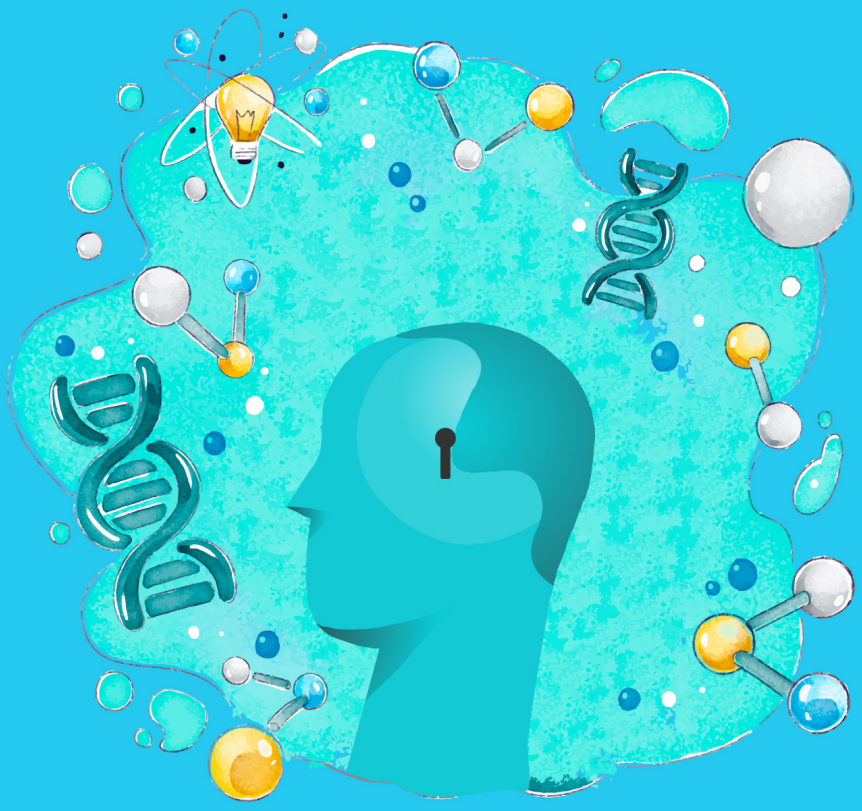

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Summary of “The Biology of Belief” by Bruce H. Lipton

Written by Alyssa Burnette

Learn about the science behind our beliefs.

Introduction

There are a lot of things the average person doesn't understand about genetics and biology. And that's okay; if we wanted to know everything about it, we would have become biologists and geneticists! But sometimes our lack of understanding leads to miscommunications as we sometimes falsely attribute things to the power of genetics or grapple with the nature vs. nurture debate. However, epigeneticist and developmental biologist Bruce H. Lipton points out that slightly less scientific things-- like our environment, our belief systems, and our worldview-- have a more powerful impact than we've previously realized. Therefore, he theorizes that if we want to arrive at a holistic understanding of humanity and how our brains work, we need to incorporate this data into our study of biology. The Biology of Belief is his attempt to do just that and we'll explore his findings through the course of this summary.

The Origin of Evolution

There are a number of misconceptions in our education. For example, we commonly hear that, “In fourteen hundred and ninety two, Columbus sailed the ocean blue” as a mnemonic device to help us remember that Columbus discovered America. But of course, he didn’t, and neither did Amerigo Vespucci, for whom America was ultimately named. In fact, we now know that Viking explorer Leif Erikson discovered America about five centuries before either Columbus or Vespucci set out. And yet this misinformation often persists! The same is true with our scientific education. Because if you were to ask anyone who the father of evolution is, pretty much everybody would say Darwin, right? But did you know that Darwin wasn’t actually the first guy to think up the concept of evolution?

Just as we often forget about Leif Erikson’s historic exploration, we also forget about French biologist Jean-Baptiste Lamarck, who thought of the theory of evolution a few decades before Darwin did. However, we can be forgiven for being confused because the two ideas are somewhat different from one another. For example, we characterize Darwin’s theory of evolution through terms like “survival of the fittest” which implies that every creature on earth is in a battle to acquire limited resources and preserve their species against all odds. Lamarck, by contrast, took a more relaxed approach. Instead, he suggested that individual organisms had banded together for the sake of preserving their species. According to his theory, living creatures-- a category which encompassed everything from amoebas to microbes to humans and animals-- had recognized the value of cooperation and collaboration. This foundational principle bolstered Lamarck’s theory of evolution because it posited that, instead of experiencing random mutations, living creatures began to adapt in response to their environment and worked together to ensure the survival of their species.

From this brief exploration of Lamarck’s theory, you can see that-- even though we herald Darwin as the founder of evolution-- Lamarck’s ideology

is actually closer to what we know about evolution today. We know, for example, that our immune systems work according to this model, adapting to fight off viruses and infections. And just as Lamarck suggested, we also know that our cells can pass on the knowledge they've acquired to the cells they reproduce. As a result, future generations of cells can remember what they've learned and adapt as they too acquire new information.

This in turn furthers the cycle of evolution and preserves the cells' updated information. Advances in modern science have also illustrated that symbiotic relationships between different species exist, both in the animal kingdom and within our own bodies. This, of course, supports Lamarck's theory that organisms work together to promote survival. And perhaps most interestingly, we can see that reproduction between the same species isn't the only way to pass on genetic material. In fact, in keeping with Lamarck's theory, we will see that genes can actually be shared between different species, creating something different and new. We'll explore this and other fascinating aspects of our relationship with genetics in the remaining chapters.

The Simple Cell

Pop quiz! What is a cell and what does it do? If you're like me, you've probably blocked out enough of high-school biology to have completely forgotten the answer to this question (and to be very happy with that). But the author asserts that cells are actually very interesting, especially if you view them through the lens of Lamarck's theory. That's because literally every function of our entire bodies can stem from a single cell. Of course, we need groups of them working together in order to survive, but the power of a single cell is actually pretty amazing. It's even more astounding when you consider that cells as an organism have been around much longer than we have-- and that cells form the basis for every living thing. You, me, your cat-- we're all comprised of cells. And even though we can't see them working beneath the surfaces of our bodies, our study of cells have shown us that they are highly intelligent organisms who have managed to survive for eons, long after other species have died out.

But how do we know this and what can we learn about the behavior of cells? For starters, we know that our genetic code-- or DNA-- is housed in the nucleus of a cell. But the nucleus actually isn't responsible for keeping a cell alive or powering its intelligence. Rather, that function belongs to the cell's membrane. It's no coincidence that that sounds like we're referring to the cell's brain; the membrane-- which is the outer coating of the cell-- is responsible for housing and powering the cell's intelligence. So, even though a cell could survive without its nucleus, if you robbed it of its membrane, the cell would lose its intelligence, shut down, and die.

Genetics do Not Determine Our Fate

Some things truly are genetic. The color of your eyes, the shape of your face, your body's build and metabolism-- all of these things are determined by genetics. And because so many things genuinely are influenced by our genes, we often erroneously assume that many other things are as well. But the truth is that your genes do not determine your development or the type of person you become and they aren't necessarily more powerful than your environment in every single case. In fact, Darwin himself recognized this in the latter stages of his life as he began to question whether he had considered the full impact of our environment on our biology.

Today, we know that he didn't and that this failure exposes a core flaw of Darwinian theory. For example, the theory of genetic determinism-- an off-shoot of Darwinism-- posits that our genes regulate and determine the proteins which make up our bodies. But the author acknowledges that there is a fundamental error which renders this school of thought inaccurate. If we consider the human genome-- which contains 25,000 genes-- then this can't possibly be true. Because if our genetics depended entirely on our biology, the human genome would have to contain a protein for each individual gene. This would result in a baseline minimum of 120,000 genes. So, as you can see, it is impossible for our genes to control our biology on their own. This, of course, necessitates a search for the missing factors which govern our genes.

The author argues that environment is one of them and that-- just as all living organisms work together to achieve survival-- so our bodies' proteins network with our environment in order to identify the right course of direction for each cell. This determines which sequences of DNA are activated and therefore governs the destiny of the cell. To put this into context, let's say someone has a genetic disease like Tay-Sachs. Tay-Sachs disease is a rare genetic disorder that is inherited when both parents carry the mutated gene. When a child is affected, this means that they have received a copy of the mutated gene from both of their parents.

But what makes Tay-Sachs extremely rare is the fact that it only develops in people with certain ethnicities or ancestry. In most cases, this is limited to people of Ashkenazi Jewish descent. So, this means that if you have Ashkenazi Jewish heritage, it's possible that you or someone in your family might be a carrier for this disease or be more susceptible to developing it. But that doesn't necessarily mean that you will develop Tay-Sachs and it doesn't guarantee that you will pass it on to your children. Instead, the likelihood of you or your child developing this disease is determined by the environment provided for those cells. In this case, that environment would mean that you have procreated with someone else who is a carrier for the disease. Without that familial connection, however, your status as a Tay-Sachs carrier will likely have no impact on your life and you can assume that you will go on to have perfectly healthy children. So, from this example, we can see that biology and genetics don't exclusively determine the fate of our cells; our environment plays a significant part as well.

Mind Over Matter

As previously mentioned, we hear this phrase a lot. But what does it actually mean in relation to our biology? How does our biology impact what we believe? To flesh out this concept, let's consider something called "the placebo effect." We've all experienced the placebo effect in some way or another, although we probably don't realize it. For example, you might believe that you need your morning coffee in order to function and because of this belief, you start to feel better as soon as you sip your coffee.

But have you ever had the experience of realizing that you've been given decaf by mistake? You soon realize that what you were feeling wasn't actually the effect of the coffee at all; it was just your mind convincing you you felt better because you believe so strongly in the power of coffee! The same is true if you've ever been given an "alcoholic" drink or a joint to smoke, only to discover that it was a prank. Although you might have immediately started to feel and behave drunk or drugged, the truth is that you were only sipping a mocktail or puffing grass from your own front yard. All of these are examples of the placebo effect's power. So, how does it work?

Well, one reason is owing to the sheer power of the human mind. Although it can't quite heal anything and everything (we can't "think ourselves" into remission from cancer, for example), it comes pretty close. That's because our conscious and subconscious minds work together to regulate our bodies and help us achieve a state of equilibrium. To prove this, the author cites a study conducted by scientist Candace Pert, who discovered that the power of our minds isn't contained solely in our heads. Rather, the mind sends signals throughout the body, little bursts of power that connect with our cells and tell us how to respond to stimuli. It does this by sending out something called "signal molecules," and these molecules can go both ways: they send information from the brain to the rest of the body and then they can travel back again.

Pert discovered that this is why our bodies know how to interpret physical pain as well as emotional suffering. It's also why emotional pain can sometimes manifest as physical ailments, like the feeling that your heart has literally dropped or that the earth is slowly falling away from you. As you can see, our brains hold significant power to guide and direct our bodies. But this power isn't always used for good. That's because the brain uses these signals to "program" our behavior. In short, we utilize internal and external stimuli to construct a sort of behavioral code that tells us how to respond to stimuli. But unfortunately, the brain doesn't inherently recognize the difference between programming "good" and "bad" signals and this can result in some detrimental "software" being installed in our brains.

For example, if your mother always told you that you were fat and ugly as a child, your brain will have processed this stimuli in one of two ways. You might have tried to fight this with logic and told yourself that this isn't true and that your mother is simply a toxic person. This in turn might motivate you to do the opposite of what your mother expected of you; you might work out frequently, invest a good deal in your health and appearance, and possibly pursue careers and activities that are aimed towards the physically attractive. You might even dedicate yourself to promoting kindness and body positivity as a means of encouraging others who have endured similar treatment. That's one way your mind could have processed those messages.

But it's more likely that, as a young and malleable child, you would have been hurt and confused by this input and your brain would have internalized it as part of your "programming." You would then grow up with an internal monologue that holds statements like, "I'm Sarah, I'm fat and ugly" as its core tenets. As a result, it's likely that you would go through life believing yourself to be exactly what your mother said and this belief could motivate you to alter your choices. You might refrain from pursuing potential relationships, for example, believing that you're too fat or ugly for anyone to want to date. You might neglect your health and appearance, believing that any efforts you make won't matter. And this in turn will alter the course of your life, whether you truly are fat or ugly or not. As you can

see from this chapter, there are some occasions when the positive or negative stimuli we believe can override our biology.

Parental Behavior Impacts Our Environment

Over the course of the previous chapters, we've learned quite a few different things. We know, for example, that Darwin's theory of evolution isn't necessarily correct, that biology doesn't determine the fate of our genes, and that what we program into our brains can sometimes override our biology (and by extension, our futures). We also know that both biology and genetics are heavily influenced by our environment. So, having examined the impact of parental behavior on our belief systems in one example, let's continue that line of thinking and take a closer look at the impact of parental behavior on our environment.

Contrary to Darwinism, your child's personality, fate, and genetics are not necessarily pre-determined. You might think that your child's genes will decide who they become, how they will look, and what they will struggle with but that's not necessarily true. Instead, your baby is actually being shaped by your environment and the decisions you make while they are in utero. This is even true for factors beyond your control. For example, trauma researchers have discovered that trauma can be inherited. So, if a pregnant woman lived through a tragedy like the Holocaust or 9/11, her heightened survival instincts and sense of fear can quite literally seep into her child, permeating that child's genetic code. As a result, your baby might come into the world with heightened sensitivity and survival instincts similar to those seen in PTSD sufferers. A mother's genetics can also determine whether your child is more susceptible to developing asthma, diabetes, mental illnesses like anxiety and depression, or diseases like Tay-Sachs, as discussed in an earlier example.

But even though that might sound pretty scary, there are a number of positive ways that you can influence your child's development as well. For example, it's common knowledge that maintaining a healthy diet during pregnancy and avoiding substances like alcohol and coffee can set your baby up for a healthy start. And once your baby arrives, you can also take positive steps to form their understanding of the world. Of course, one of

the most crucial and most obvious steps is to avoid programming your child with negative labels or toxic views like those depicted in the previous chapter. And even if your child does seem fat or ugly or stupid or any of a hundred other negative attributes, it's vital that you avoid communicating this to them in early life because, as we've seen, it can shape the course of their entire future and self-image.

And if that sounds like a lot of pressure, don't worry! It's unlikely that one parenting slip-up will ruin your child for life. But even if you have made decisions you regret, the good news is that just as our brains can internalize stimuli and program it into our sense of identity, so we can be trained to "reprogram" ourselves with the help of some truthful and positive messages. For example, this is why cognitive behavioral therapy or advice from a friend or therapist can help us overcome toxic mentalities and "reprogram" our lives in a healthy direction. Remember: if our brains are powerful enough to internalize negative stimuli and allow it to impact the course of our future, then we also have the power to retrain our brains and turn our lives around. Because that's the power of our biology and belief!

Final Summary

We often fall prey to common misconceptions about history, science, or even our own bodies. But as the author demonstrates, the Darwinian theory of evolution isn't necessarily correct and we need a broader, more holistic understanding of the relationship between belief and biology if we truly want to unlock the mysteries of human biology. By expanding our study, one thing we already know is that our beliefs can be so powerful as to sometimes override our biology. This indicates that our genetics are not inexorably determined by our biology and that we do indeed have the power to shape our own destinies.

However, that comes with the caveat that it is vital to be critical about what we choose to believe. And since we know that our environment can determine our biology-- and therefore, a great deal about what we believe-- we also know that it's important to be intentional about creating a healthy environment for ourselves and our children. We can also guide our futures in a positive direction by "reprogramming" our brains to unlearn some of the toxic stimuli we've absorbed and move forward towards a healthy future.